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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/673,266	09/30/2003	Oden L. Warren	204694.00102	2074

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EXAMINER

LUU, THANH X

ART UNIT PAPER NUMBER

2878

DATE MAILED: 03/31/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/673,266

Applicant(s)

WARREN ET AL.

Examiner

Thanh X Luu

Art Unit

2878

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-23 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1, 15 and 21-23 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. ____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>092003</u> . | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Specification

1. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

Claim Objections

2. Claims 1-3, 5, 11, 13, 15-18, 20, 21 and 23 are objected to because of the following informalities:

In claims 1 and 15, "the frequency", "the peak", "the displacement versus frequency curve", "the output", "the same" and "the separation distance" lack proper antecedent basis.

In claims 2 and 16, "the open loop gain" lacks proper antecedent basis.

In claim 3, "the output of said summing junction" lacks proper antecedent basis.

In claims 5 and 20, "the integrator and differentiator" lacks proper antecedent basis. Also in claim 20, "said proportioned-integral-derivative controller" lacks proper antecedent basis.

In claim 11, "the output of said demodulator" and "the oscillation displacement" lack proper antecedent basis.

In claims 13 and 21, "the frequency" at "the peak" lack proper antecedent basis. Furthermore, it is unclear what the peak is referring to.

In claim 17, "said displacement sensor" and "said RF capacitance bridge" lack proper antecedent basis.

In claim 18, "said low frequency signal" lacks proper antecedent basis.

In claim 23, "the separation distance", "the frequency", "the peak" and "the frequency versus displacement curve" lack proper antecedent basis.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 1 and 23, as understood, are rejected under 35 U.S.C. 102(e) as being anticipated by Cleveland et al. (U.S. Patent 6,038,916).

Regarding claim 1, Cleveland et al. disclose (see Figure 2) an apparatus for intermittent contact imaging comprising: a sensor (2) to contact intermittently a sample (4) to be imaged and generating displacement signals during oscillation; a scanner (see column 5, lines 35-39) adjacent the sensor and supporting the sample, the scanner being actuable to move the sample relative to the sensor to bring the sensor into intermittent contact with the sample; a controller (12 and 14) in communication with the sensor and the scanner, the controller including a sensor feedback circuit receiving the displacement signals (from 18) and an AC setpoint signal (from AC signal source) having a frequency (see Figure 5) equal to the frequency at the peak of a displacement versus frequency curve, an output of the sensor feedback circuit being applied to the

sensor to oscillate it, the controller further providing output to the scanner in response to the displacement signals to control a separation distance between the sensor and the sample.

Regarding claim 23, Cleveland et al. disclose (see Figure 2) a method of imaging a sample surface comprising: oscillating a sensor (2) at a driven setpoint frequency to cause the sensor to intermittently contact a sample (4) to be imaged; generating displacement signals in response to oscillations of the sensor; moving (see column 5, lines 35-39) the sample relative to the sensor to maintain a separation distance between the sensor and the sample; and rastering the sensor over the sample surface, the setpoint frequency (see Figure 5) equal to the frequency at a peak of a frequency versus displacement curve.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 15, 21 and 22, as understood, are rejected under 35 U.S.C. 103(a) as being unpatentable over Cleveland et al. in view of the publication of Joyce et al. ("A new force sensor incorporating force-feedback control for interfacial force microscopy", published March 1991).

Regarding claims 15, 21 and 22, Cleveland et al. disclose (see Figure 2) an apparatus for intermittent contact imaging comprising: a sensor (2) to contact

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intermittently a sample (4) to be imaged and generating displacement signals during oscillation; a scanner (see column 5, lines 35-39) adjacent the sensor and supporting the sample, the scanner being actuable to move the sample relative to the sensor to bring the sensor into intermittent contact with the sample; a controller (12 and 14) in communication with the sensor and the scanner, the controller including a sensor feedback circuit receiving the displacement signals (from 18) and an AC setpoint signal (from AC signal source) having a frequency (see Figure 5) equal to the frequency at the peak of a displacement versus frequency curve, an output of the sensor feedback circuit being applied to the sensor to oscillate it, the controller further providing output to the scanner in response to the displacement signals to control a separation distance between the sensor and the sample. The frequency of the AC setpoint is inherently equal to the frequency at a peak. Further, since Cleveland et al. disclose the same structure of the feedback circuit, the circuit inherently behaves similar to a second order, low pass filter. Cleveland et al. do not specifically disclose the sensor being a differential-capacitance displacement sensor. Joyce et al. teach (see Figures) a differential-capacitance displacement sensor having a similar arrangement. Thus, Joyce et al. recognize that capacitance displacement sensors are more stable in detecting interfacial force. It would have been obvious to a person of ordinary skill in the art at the time the invention was made to provide a capacitance displacement sensor in the apparatus of Cleveland et al. in view of Joyce et al. to provide more stable detection as taught.

Allowable Subject Matter

7. Claims 2-14 and 16-20 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

8. The following is a statement of reasons for the indication of allowable subject matter: an apparatus as claimed, more specifically in combination with: the feedback circuit being adjusted so that the displacement signals are in phase with the AC setpoint signal at a frequency where an open loop gain of the feedback circuit is one, is not disclosed or made obvious by the prior art of record.

Conclusion

9. This is a continuation of applicant's earlier Application No. 10/158,826. All claims are drawn to the same invention claimed in the earlier application and could have been finally rejected on the grounds and art of record in the next Office action if they had been entered in the earlier application. Accordingly, **THIS ACTION IS MADE FINAL** even though it is a first action in this case. See MPEP § 706.07(b). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

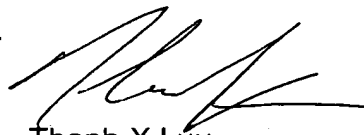
A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no, however, event will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thanh X Luu whose telephone number is (571) 272-2441. The examiner can normally be reached on M-F (6:30-4:00) First Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Porta can be reached on (571) 272-2444. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Thanh X Luu
Primary Examiner
Art Unit 2878